

ConferenceXP: A Research Project for Advanced Collaboration and Conferencing

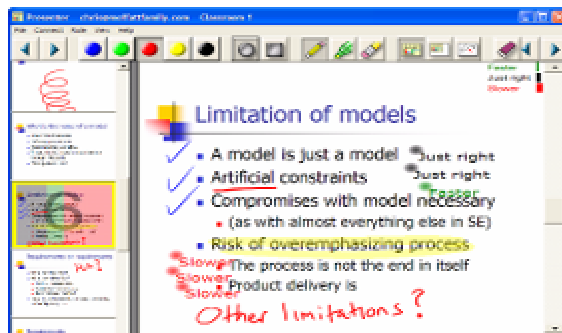
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<http://research.microsoft.com>

The ConferenceXP Project

How compelling and deep can we make the experience if we assume high bandwidth, wireless devices, and Windows?

Collaboration



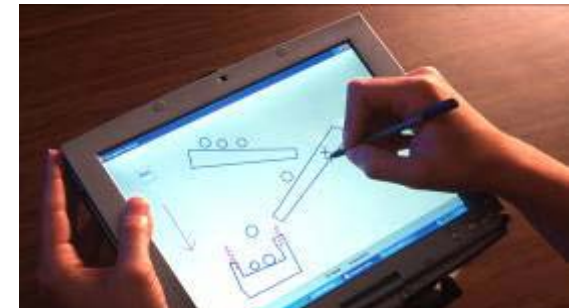
Presentation Collaboration

Conferencing

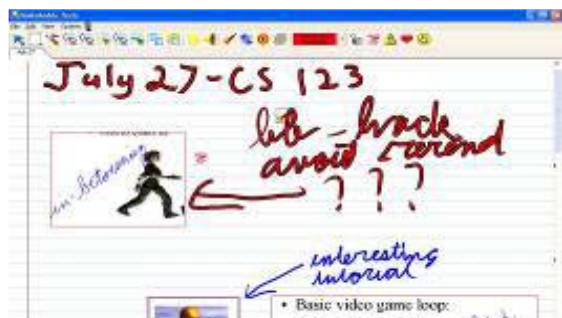


Classroom Experience

Visualization



Simulation Experience



Student Collaboration



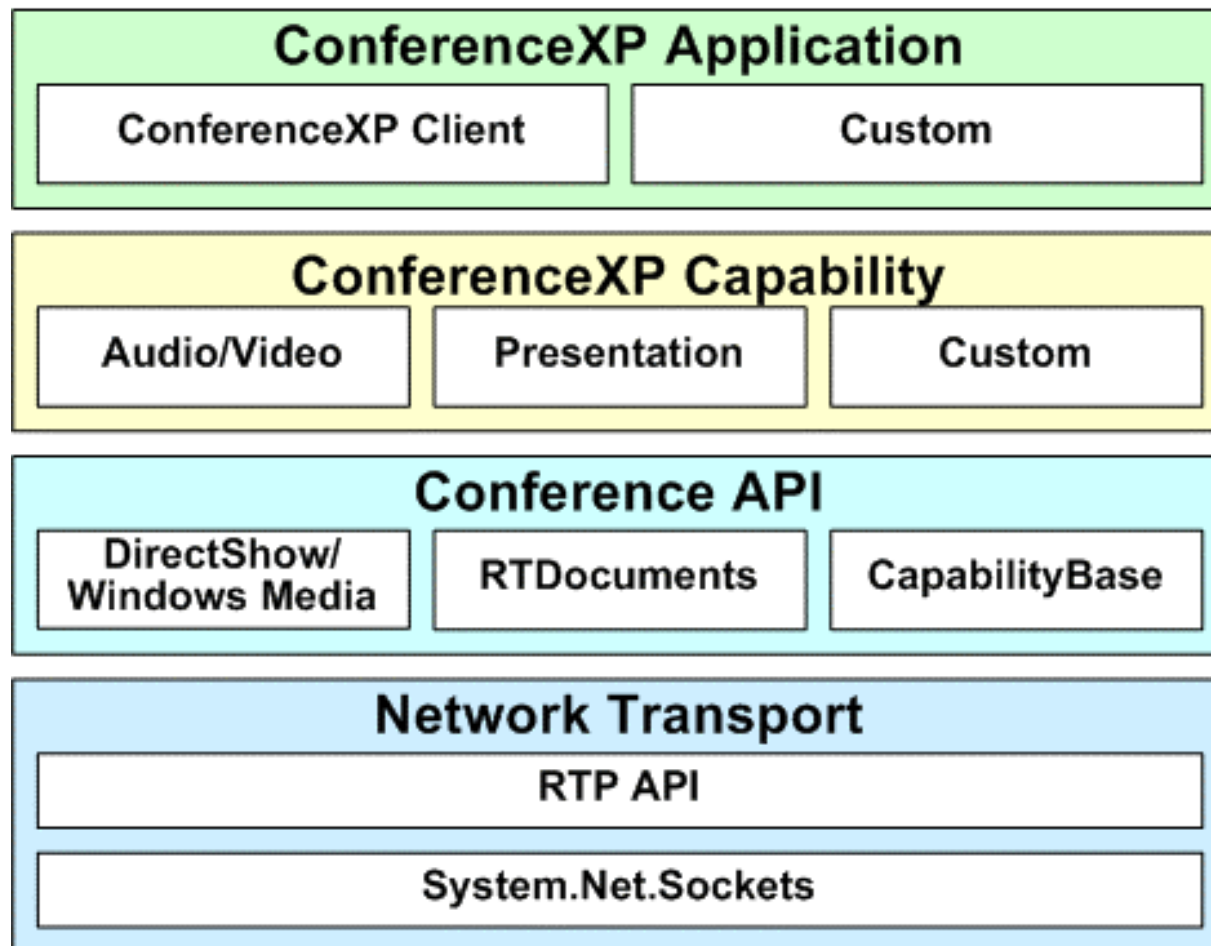
Mentor Experience



Gaming Experience

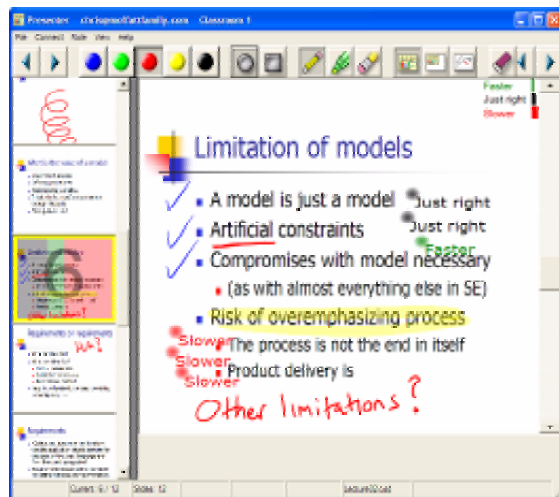
Goals

- Build a research platform to support conferencing and the development of rich collaborative applications.



Goals

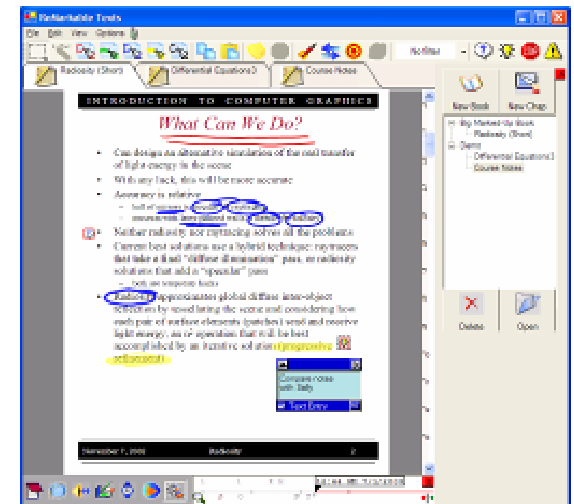
- Build research platform to support conferencing and the development of rich collaborative applications
- Collaborate with the research community to prototype collaboration and conferencing applications that use ConferenceXP



Presenter (UW)



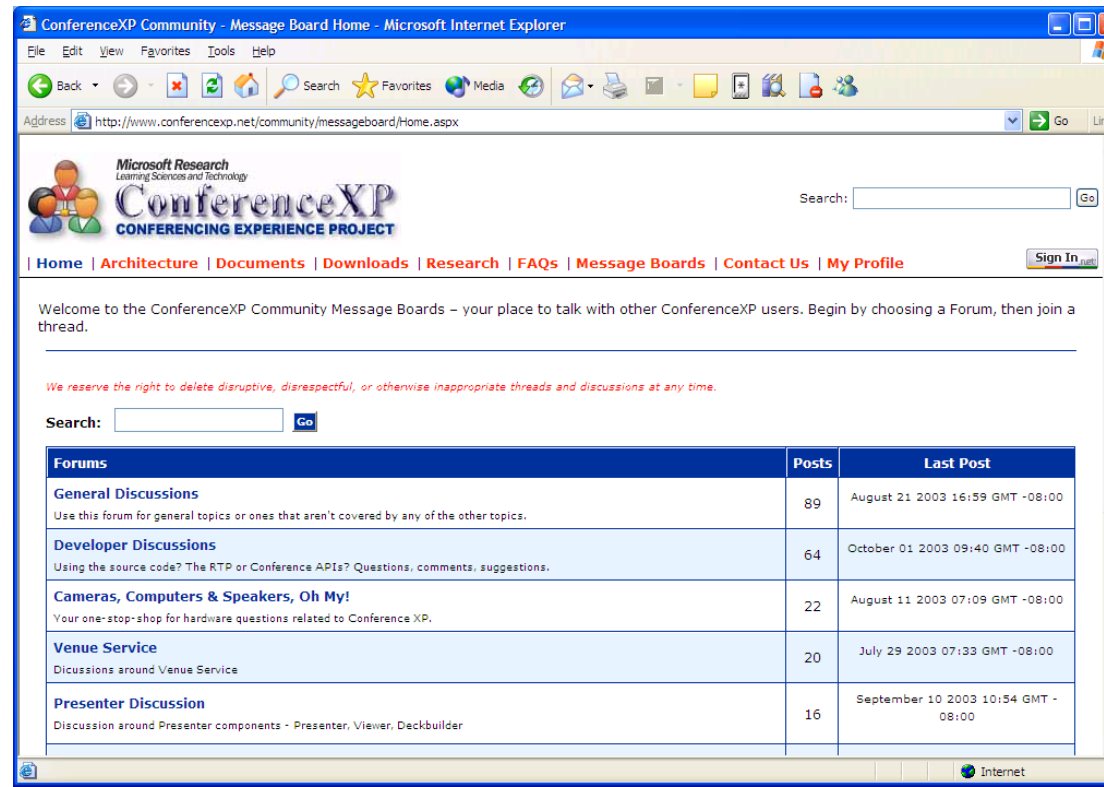
ConferenceXP Client



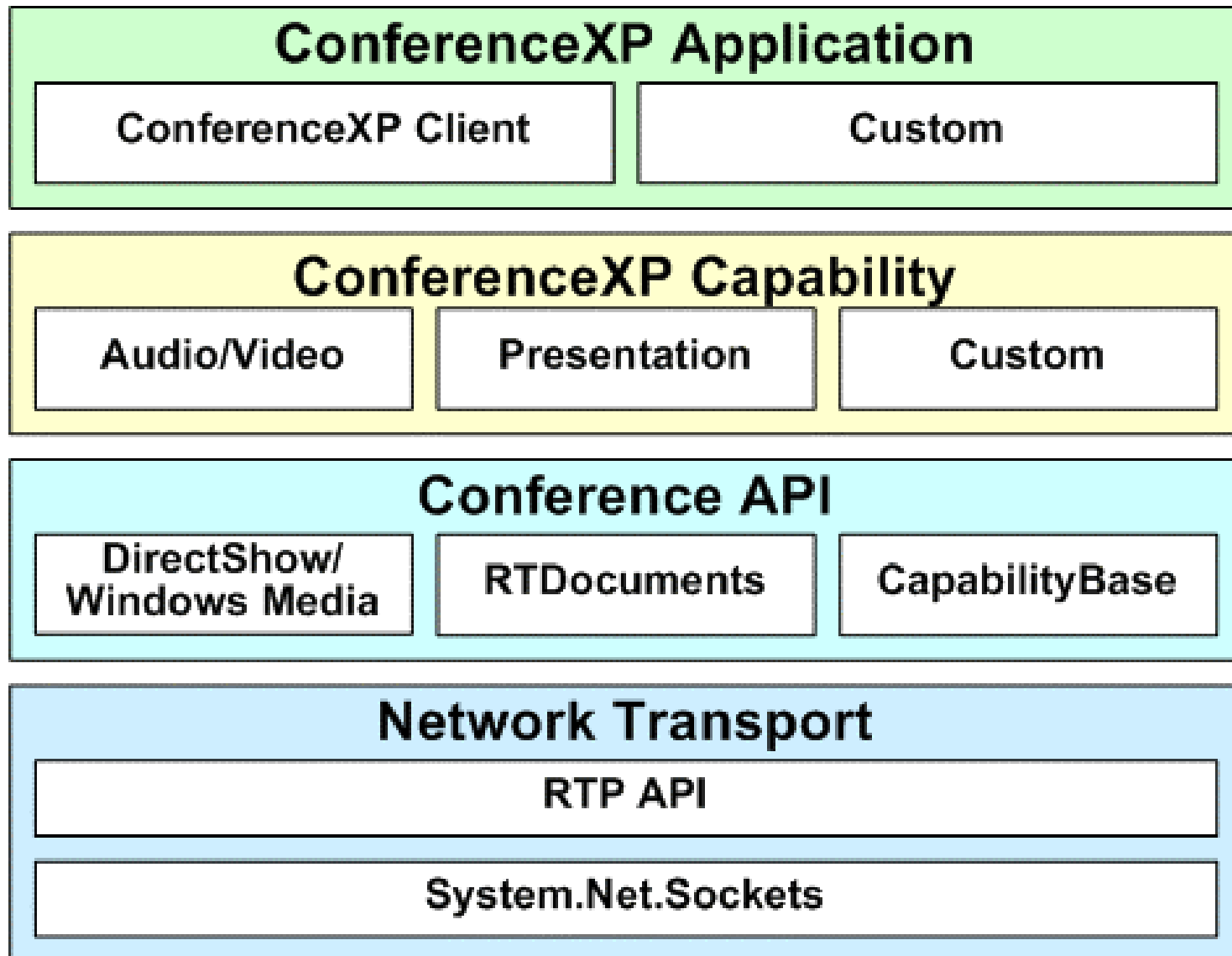
Remarkable Texts

Goals

- Build research platform to support conferencing and the development of rich collaborative applications
- Collaborate with research community to prototype learning applications that use ConferenceXP
- Develop a community of developers and implementers



ConferenceXP Research Platform

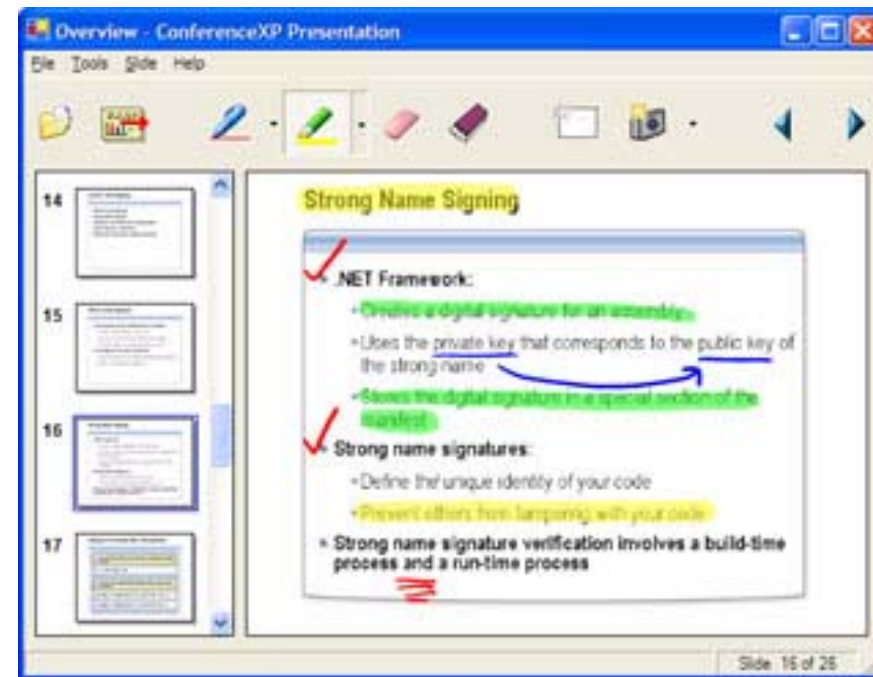
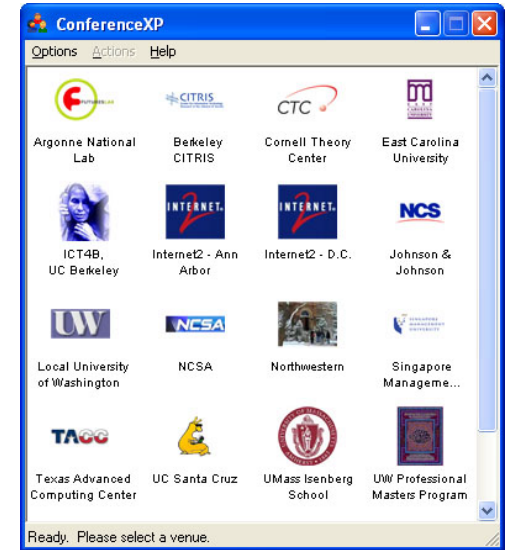


Why Windows?

- World class codecs in the box:
 - Audio
 - Video
 - Screen Capture
- Managed Code & .NET Framework
- Web Services support
- Single platform development

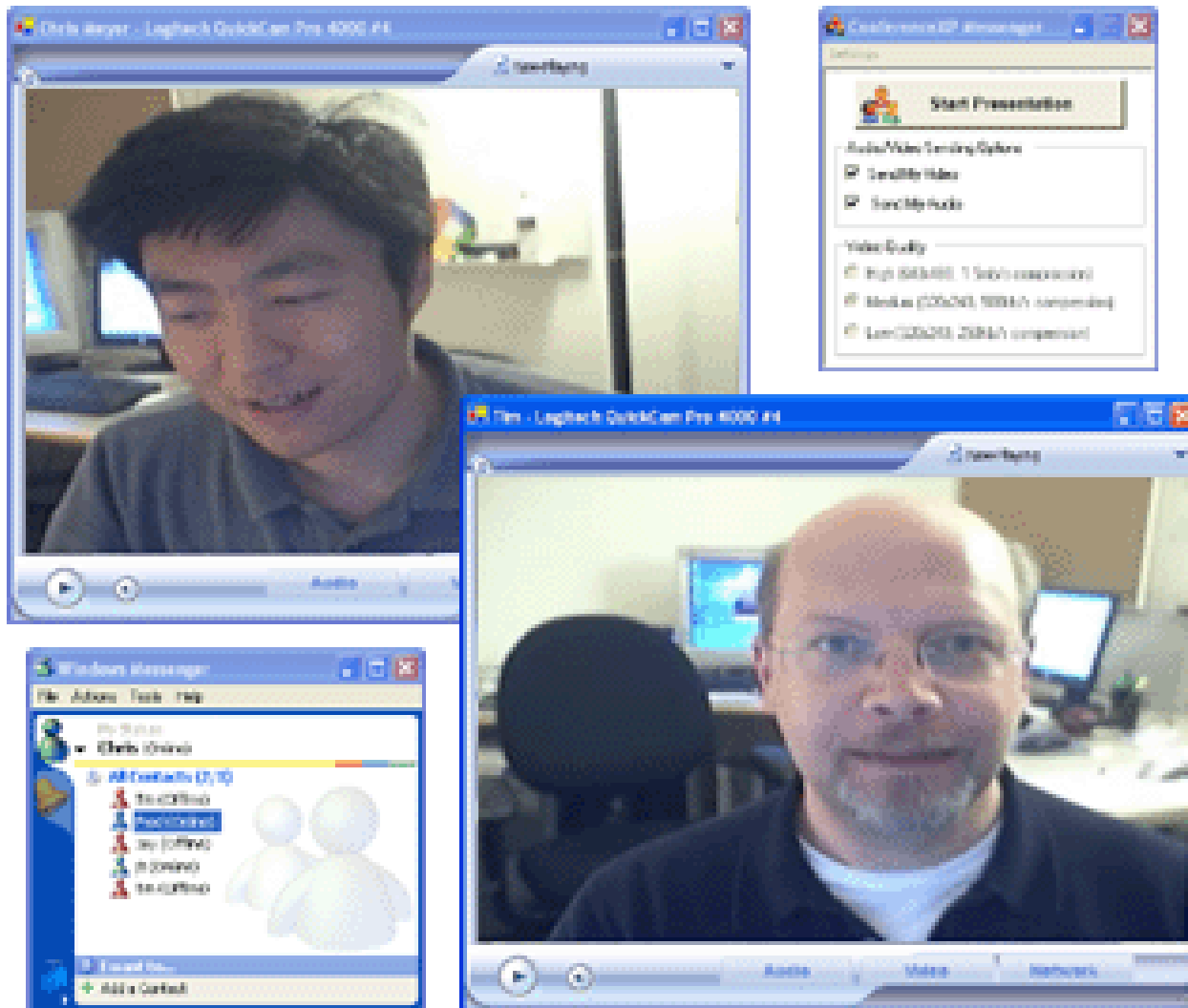
ConferenceXP Client

- High-quality multipoint conferencing
- Peer-peer, multicast architecture
- Full-screen real-time video at 30 fps
- Built-in presentation capability



ConferenceXP For Windows Messenger

- Point-point unicast solution integrated with Windows Messenger

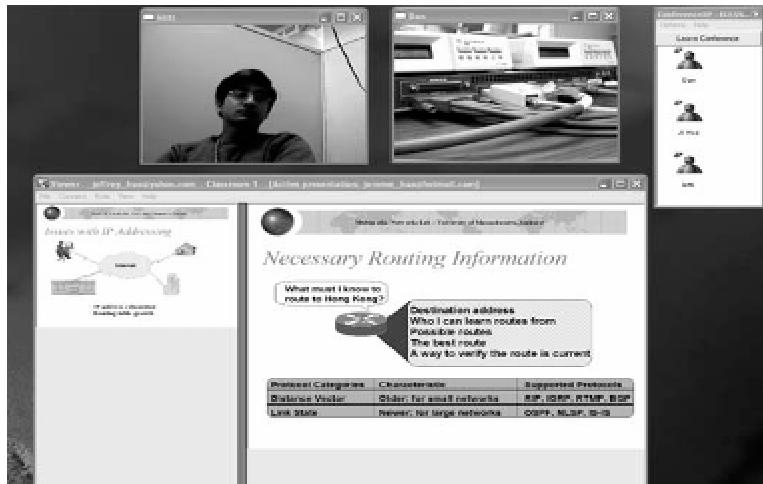


University of Washington

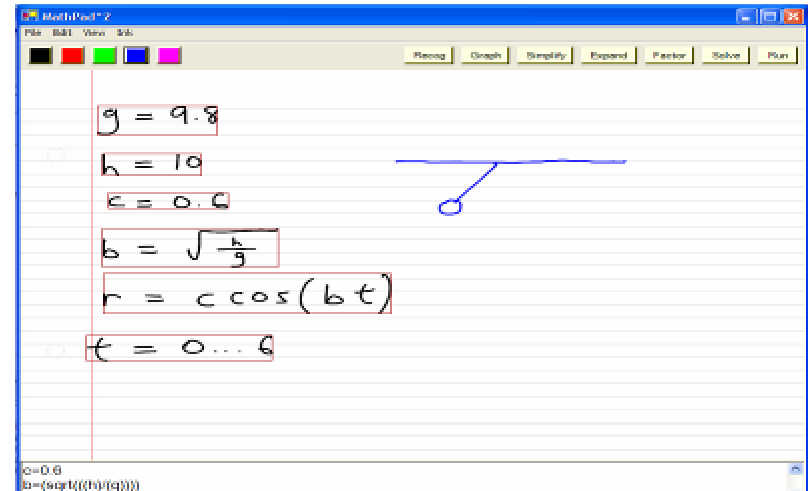
Professional Masters Program (CS)



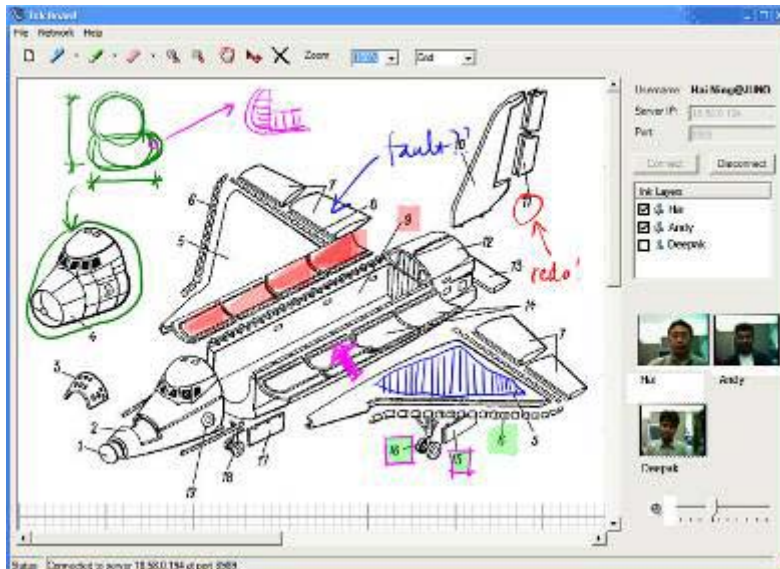
Sample Research Applications built on CXP



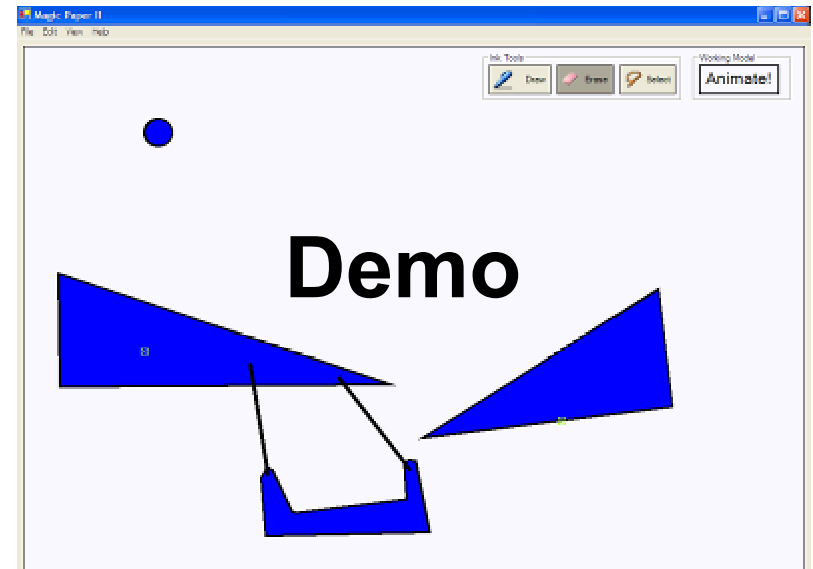
Collaborative Labs - Amherst



Math Visualization - Brown



Design Sketching - MIT



Collaborative Physics Sketching

Current Problems:

Good News:

- Same networking and A/V requirements as the Access Grid.

Bad News:

- Same networking and A/V requirements as the Access Grid.
- ***Deploying multi-cast enabled applications on Internet2 continues to be very, very painful!***
- ***Installing and configuring acoustic echo cancellation is difficult and expensive.***
- Venue servers, Archive servers require IT support

Current development focus (2.5)

Enabling ConferenceXP applications to work well over wireless – for conference/large lecture scenarios

- Advanced Forward Error Correction (Reed-Solomon)
- Support for re-transmission of documents and ink data streams

Improved usability and diagnostics (UI)

Windows Media player support for streaming video (includes HD)

Areas for Future Research and Collaboration

- Generic application display support
- “Venueless Operation” (true peer2peer)
- Archive Server
- Interoperability with Access Grid
- Multi-camera support
- Secure operation
- Full IM integration
- Unicast support

- 2.5 User Interface Prototype



System Software Vendor's View

- TP is partly a component product problem
 - Hardware
 - Operating system
 - Database system
 - Application server
- TP is partly a system engineering problem
 - Getting all these components to work together to produce a system with all these "things"
- This course focuses primarily on the Database System and Application Server

compression



error rate



multicast



50%



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compression



error rate



multicast



100%





compression



error rate



multicast



50%





The symmetric key is in turn encrypted with the public asymmetric key of the server. The server can then decrypt using its private asymmetric key to recover the symmetric key which can then be used to obtain the plain text from the cypher text. If a stream cypher is used, then the message authentication code must be applied to preserve integrity. Why are we doing two encryptions for a single message? Well that's mostly for efficiency. This allows the symmetric key to be used for subsequent messages, both from the server to the client, and from the client to the server. And so, the plain text



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multicast



Getting Involved

- Joint the ConferenceXP Community site
- Deploy a ConferenceXP Personal Node
- Talk to us about your ideas for cool, collaborative applications that can be enabled over ConferenceXP
- <http://www.conferencexp.net>

- Questions?